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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/506,668	09/07/2004	Hiroyuki Hasegawa	042664	4964

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EXAMINER	
SEMENENKO, YURIY	
ART UNIT	PAPER NUMBER
2841	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	12/20/2006	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	10/506,668	HASEGAWA ET AL.	
	Examiner	Art Unit	
	Yuriy Semenenko	2841	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *05 October 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *20-41* is/are pending in the application.

4a) Of the above claim(s) *25-41* is/are withdrawn from consideration.

5)☒ Claim(s) *24* is/are allowed.

6)☒ Claim(s) *20-23* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *07 September 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *09/7/04; 11/23/04*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

1 Applicant's election without traverse of Group I, claims 20-24 without traverse in the reply filed on 10/05/2006 is acknowledged. Claims 25-41 have been withdrawn from consideration.

Claims 20-41 are now pending in the application.

Specification

2. The disclosure is objected to because of the following informalities:

Before OHP applicant is required to state the full term.

Appropriate correction is required.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

3.1. Claims 20-23 are rejected under 35U.S.C. 103(a) as being unpatentable over Admitted by Applicant (Prior Art, hereinafter "APA") in view of Nakayama et al. (Patent # 6892432 hereafter Nakayama) and in view of Boggild (PGPub. #2002/0061662).

As to claim 20: APA discloses an electrolytic apparatus for producing an electrically conductive wire (specification, page 2) inherently comprising: two electrodes, an electrolytic cell for holding an electrolyte and the two electrodes, the gap between the two electrodes, and the electrically conductive wire is produced between the two electrodes or above the two electrodes (specification, page 1, and for example Moriyama et al. (Patent JP-06-321686) hereinafter Moriyama, [0003], [0006]), by allowing the electrolytic cell to hold an electrolyte containing molecules that is to constitute an electrically conductive wire (for example Moriyama, Fig. 2 and Muller et al. (Patent #5501778) hereinafter Muller), wherein the electrolyte and the two electrodes are in contact (Moriyama and Muller).

However, APA does not teach the electrically conductive wire is the electrically conductive nano-wire; and a voltage control device for controlling the voltage applied across the two electrodes; and electrolytic cell holds an electrolyte containing molecules that is to constitute an electrically conductive nano-wire, and generate a gradient of voltage between the two electrode by applying a voltage across the two electrodes in the state wherein the electrolyte and the two electrodes are in contact.

Nakayama discloses in "Background of the invention" section, Fig. 11, at the time the invention was made, it was well known to use two electrodes 22, 23 and a voltage control device19, 26, Fig. 12 for controlling the voltage applied across the two electrodes; and cell holds an electrophoretic solution 20 containing molecules that is to constitute an electrically conductive nano-wire (column 2, lines 35-39), and generate a gradient of voltage between the two electrode by applying a voltage across the two

electrodes in the state wherein the solution and the two electrodes are in contact (column 2, lines 40-67).

Therefore it would have been obvious to one of ordinary skill in the art, at time the invention was made, for APA to include in his invention that the electrically conductive wire is the electrically conductive nano-wire; and a voltage control device for controlling the voltage applied across the two electrodes; and electrolytic cell holds an electrolyte containing molecules that is to constitute an electrically conductive nano-wire, and generate a gradient of voltage between the two electrode by applying a voltage across the two electrodes in the state wherein the electrolyte and the two electrodes are in contact as taught by Nakayama because Nakayama teaches that such a configuration would made a probe needle that detects information by directly contacting the sample surface in required (column 1, lines 16-20).

APA fail also to discloses the gap between the two electrodes is from 1 nm to 100 μm.

Boggild discloses in Fig. 1 the gap between the two electrodes 5 is from 1 nm to 100 μm (page 4, [0059]).

Therefore it would have been obvious to one of ordinary skill in the art, at time the invention was made, for APA to include in his invention that the gap between the two electrodes is from 1 nm to 100 μm, in order to manipulate with nanoscale structures, as taught by Boggild (page 1, [0013]).

As to claim 21: APA discloses an electrolytic apparatus for producing an electrically conductive nano-wire having all of the claimed features as discussed above with respect claim 20,

However, APA does not teach that the two electrodes are formed on a substrate.

Nakayama discloses in "Background of the invention" section, Fig. 11 and 12 at the time the invention was made, it was well known to use the two electrodes 22, 23 are formed on a substrate 21, (column 2, lines 35-40).

Therefore it would have been obvious to one of ordinary skill in the art, at time the invention was made, for APA to include in his invention that the two electrodes are

formed on a substrate to make holder for nano-tube cartridge, as taught by Nakayama (column 3, lines).

As to claim 22: APA discloses an electrolytic apparatus for producing an electrically conductive wire (specification, page 2) inherently comprising: two electrodes facing each other, the electrolytic cell comprises: an electrolyte holder section for holding the electrolyte (intended use), and the two electrodes, the gap between the two electrodes, and the electrically conductive wire is produced between the two electrodes or above the two electrodes (specification, page 1, and for example Moriyama et al. (Patent JP-06-321686) hereinafter Moriyama, [0003], [0006]), by allowing the electrolytic cell to hold an electrolyte containing molecules that is to constitute an electrically conductive wire (for example Moriyama, Fig. 2 and Muller et al. (Patent #5501778) hereinafter Muller), wherein the electrolyte and the two electrodes are in contact (Moriyama and Muller).

Although APA does not explicitly teach the electrolytic cell comprises a substrate plug section for plugging the substrate (intended use), it has been held to be within the general skill of a worker in the art to make reversal of parts as matter of obvious engineering choice, In re Gazda, 219 F.2d 449, 104 USPQ 400 (CCPA 1955)

Therefore it would have been obvious to one of ordinary skill in the art, at time the invention was made, for APA to include in his invention that the electrolytic cell comprises a substrate plug section for plugging the substrate in order to easy assemble electrolytic cell.

However, APA does not teach the electrically conductive wire is the electrically conductive nano-wire; and the electrolytic cell comprises: an electrolyte holder section for holding the electrolyte, and the electrodes are formed on substrate and a voltage control device for controlling the voltage applied across the two electrodes; and electrolytic cell holds an electrolyte containing molecules that is to constitute an electrically conductive nano-wire, and generate a gradient of voltage between the two electrode by applying a voltage across the two electrodes in the state wherein the electrolyte and the two electrodes are in contact.

Nakayama discloses in "Background of the invention" section, Fig. 11, at the time the invention was made, it was well known to use the cell comprises: an electrophoretic solution holder section for holding the solution (intended use), and two electrodes 22, 23 are formed on a substrate 21, (column 2, lines 35-40), a voltage control device19, 26, Fig. 12 for controlling the voltage applied across the two electrodes; and cell holds an solution containing molecules that is to constitute an electrically conductive nano-wire (column 2, lines 35-39), and generate a gradient of voltage between the two electrode by applying a voltage across the two electrodes in the state wherein the solution and the two electrodes are in contact (column 2, lines 40-67).

Therefore it would have been obvious to one of ordinary skill in the art, at time the invention was made, for APA to include in his invention that the electrolytic cell comprises: an electrolyte holder section for holding the electrolyte, and the electrodes are formed on substrate and the electrically conductive wire is the electrically conductive nano-wire; and a voltage control device for controlling the voltage applied across the two electrodes; and electrolytic cell holds an electrolyte containing molecules that is to constitute an electrically conductive nano-wire, and generate a gradient of voltage between the two electrode by applying a voltage across the two electrodes in the state wherein the electrolyte and the two electrodes are in contact as taught by Nakayama because Nakayama teaches that such a configuration would made a probe needle that detects information by directly contacting the sample surface in required (column 1, lines 16-20).

APA fail also to discloses the gap between the two electrodes is from 1 nm to 100 μm and the two electrodes have respective protrusions located either between both ends of each electrode and extending toward the other electrode, or on one end of each electrode and extending toward the other electrode by bending the each electrode at the one end;

Boggild discloses in Fig.1 the gap between the two electrodes 5 is from 1nm to 100 μm (page 4, [0059]), the two electrodes have respective protrusions located

between both ends of each electrode and extending toward the other electrode 15, Fig. 3B.

Therefore it would have been obvious to one of ordinary skill in the art, at time the invention was made, for APA to include in his invention that the gap between the two electrodes is from 1 nm to 100 μm and the two electrodes have respective protrusions located either between both ends of each electrode and extending toward the other electrode, or on one end of each electrode and extending toward the other electrode by bending the each electrode at the one end in order to manipulate with nanoscale structures, as taught by Boggild (page 1, [0013]).

As to claim 23: APA discloses an electrolytic apparatus for producing an electrically conductive nano-wire having all of the claimed features as discussed above with respect claim 22, and inherently the two electrodes have an insulated portion covered with an insulator; and the site of the substrate plug section exposing the substrate when the substrate is plugged in the substrate plug section is covered with an insulator. Without such insulators on substrate and on electrodes electrolytic apparatus can not generate a gradient of voltage between the two electrode by applying a voltage across the two electrodes in the state wherein the electrolyte and the two electrodes are in contact.

However, APA does not teach each end of the protrusions of the two facing electrodes faces each other in parallel.

Boggild discloses in Fig.1 the gap between the two electrodes 5 is from 1nm to 100 μm (page 4, [0059]), the two electrodes have respective protrusions located between both ends of each electrode and extending toward the other electrode 15, Fig. 3B and each end of the protrusions of the two facing electrodes faces each other in parallel.

Therefore it would have been obvious to one of ordinary skill in the art, at time the invention was made, for APA to include in his invention that each end of the

protrusions of the two facing electrodes faces each other in parallel in order to manipulate with nanoscale structures, as taught by Boggild (page 1, [0013]).

Allowable Subject Matter

4. The following is a statement of reasons for the indication of allowable subject matter:

As to claim 24: " An electrolytic apparatus for producing an electrically conductive nano-wire comprising a gate electrode formed on the substrate, an insulating layer covering the gate electrode, two facing electrodes formed on the insulating layer; and a voltage control device connected to the gate electrode and two electrodes for controlling the voltages applied across the gate electrode and two electrodes" in combination with other claimed limitations in independent claim 24 are not disclosed or suggested by the prior art.

Relevant Art

5. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Cruchon-Dupeyrat PGPub. No.: 2004/0026681

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Yuriy Semenenko whose telephone number is (571) 272-6106. The examiner can normally be reached on 8:30am - 5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dean A. Reichard can be reached on (571)-272-2800 ext. 31. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

YS

DEAN A. REICHARD
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12/19/06